Modernizing the Old Colony Lines

Rapid, Reliable Transit for Brockton and the South Shore

Introduction

This report details infrastructure and service improvements for the MBTA's Old Colony lines (Middleborough/Lakeville, Kingston/Plymouth, and Greenbush), serving Boston's South Shore suburbs as well as Gateway Cities like Brockton. These lines have had some of the lowest ridership in the system, and very low frequency.

But with Regional Rail improvements, the Old Colony Lines can provide frequent, affordable connections from the South Shore communities to Boston's job market and to each other, particularly Brockton and Plymouth. Regional Rail would further provide an alternative to the severe congestion on the Southeast Expressway. Here we lay out the case for upgrading these lines to Regional Rail standards, a plan which cuts trip times to South Station to 25 minutes from Brockton and 45 from Plymouth Center.

We wish to acknowledge the following TransitMatters members who contributed to this report:

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TRANSITMATTERS

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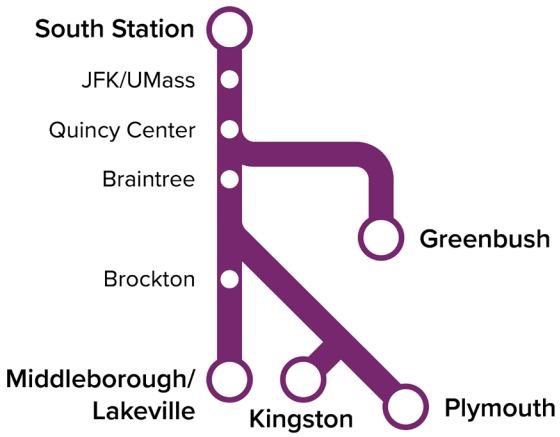
Current Situation

Pre-COVID, the Old Colony Lines had very peak-focused scheduling, even relative to the rest of the MBTA system; in Fall 2019, the Middleborough/Lakeville Line had only eight off-peak weekday trains. However, there is a significant amount of untapped demand. In particular, Brockton's high population and high job density warrants all-day bi-directional service.

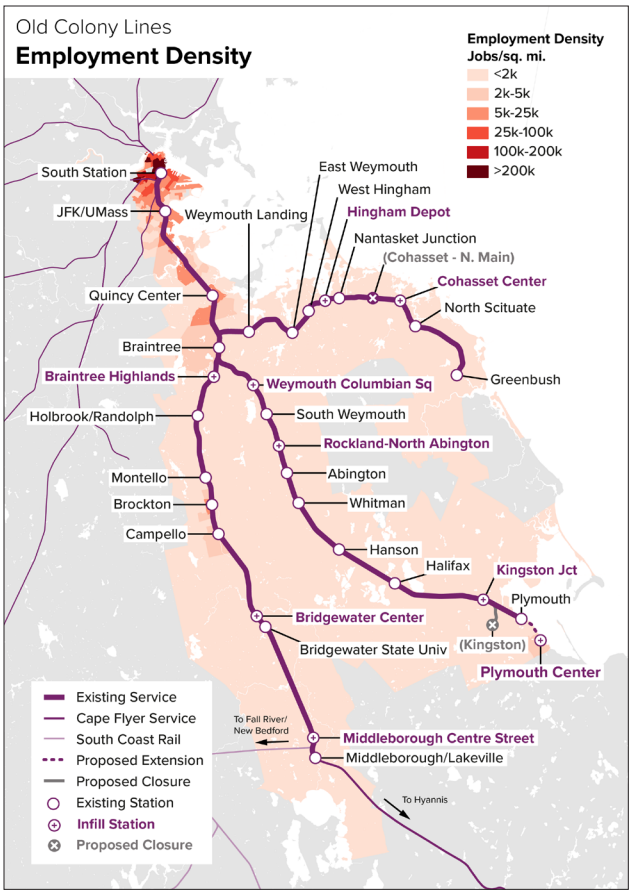
In addition to commuters, all-day service would help get tourists to attractions in Plymouth, students to and from Bridgewater State University, and workers and professionals between Brockton, Braintree, Quincy and Boston at off-peak hours. Improvements to local bus service and regional transit authorities (RTAs), particularly in Brockton will further boost ridership.

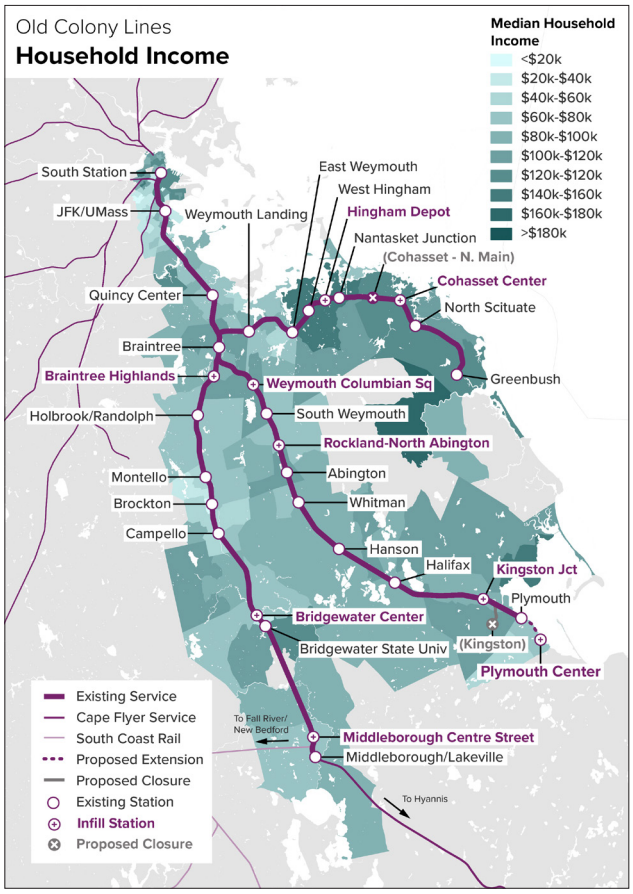
LAYOUT AND KEY STATIONS OF THE OLD COLONY LINES



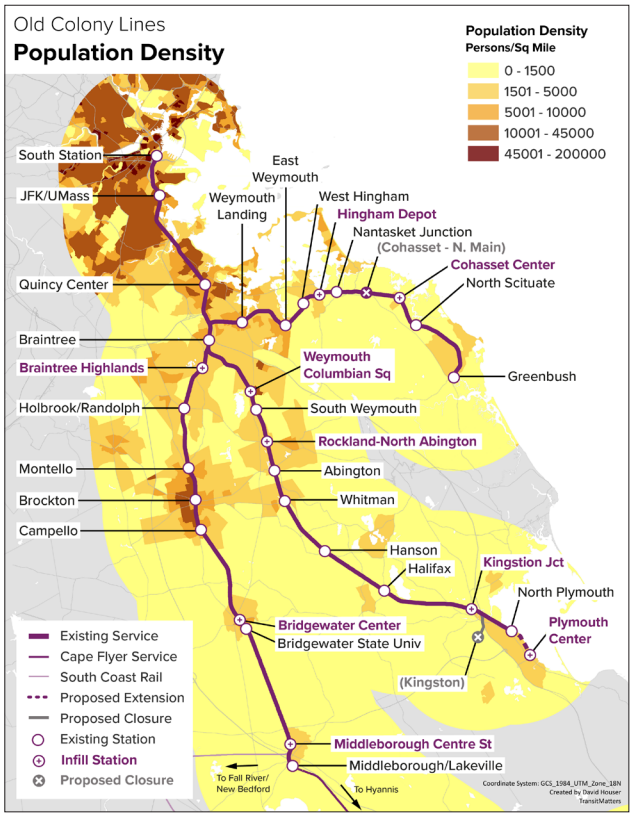
Brockton station, on the Middleborough/Lakeville line, serves a dense city and allows for connection to many of the city's bus routes.

South Weymouth is one of many suburban stations along the lines designed with parking in mind, but has recently seen nearby development with the potential for much more.





The Old Colony lines serve cities and towns with a range of residential and commercial densities, highest between Braintree and Boston (see page 6 for detail on this area).



Traffic

The inner South Shore has some of the most intense traffic congestion in the state. While traffic congestion is often perceived as a problem limited to rush-hour commuting, the Southeast Expressway's congestion issues are an all-day phenomenon. In fact, MassDOT found that, "Northbound from the Braintree Split to Morrissey Boulevard is congested for up to 12 hours on an average day; headed southbound, the two-mile segment from the Mass Pike to Morrissey Boulevard is congested for 11 hours a day."[1]

South of Braintree, the Kingston/Plymouth branch roughly parallels Route 3, which is the primary highway corridor serving the South Shore between Boston and Plymouth. The Middleborough branch parallels Route 24, which is the primary highway corridor serving Randolph, Brockton, Bridgewater, and Middleborough. Routes 24 and 3 both feed heavy amounts of traffic into I-95 and I-93, with the I-93/Route 3 interchange being especially congested.

This level of congestion also increases local pollution. Dorchester has some of Metro Boston's worst air quality, and highest incidences of asthma. Electrifying the Old Colony lines would not only remove virtually all local pollution from rail service, but increase use of the line by making service more reliable and faster, potentially reducing private car trips.

The Southeast Expressway's congestion issues are an all-day phenomenon.

Unlike the traditional Commuter Rail service model, the Regional Rail concept emphasizes all-day service over peak commuter service. Given that traffic congestion in these highway corridors often extends far past the traditional bounds of rush hour, all-day Regional Rail service would be especially useful for residents living within the Old Colony service area, many of whom travel northbound to the city for non-traditional work schedules, shopping, events and other off peak trips.

1 *Massachusetts Department of Transportation. Congestion in the Commonwealth.* https://www.mass.gov/doc/congestion-in-the-commonwealth/download

Development

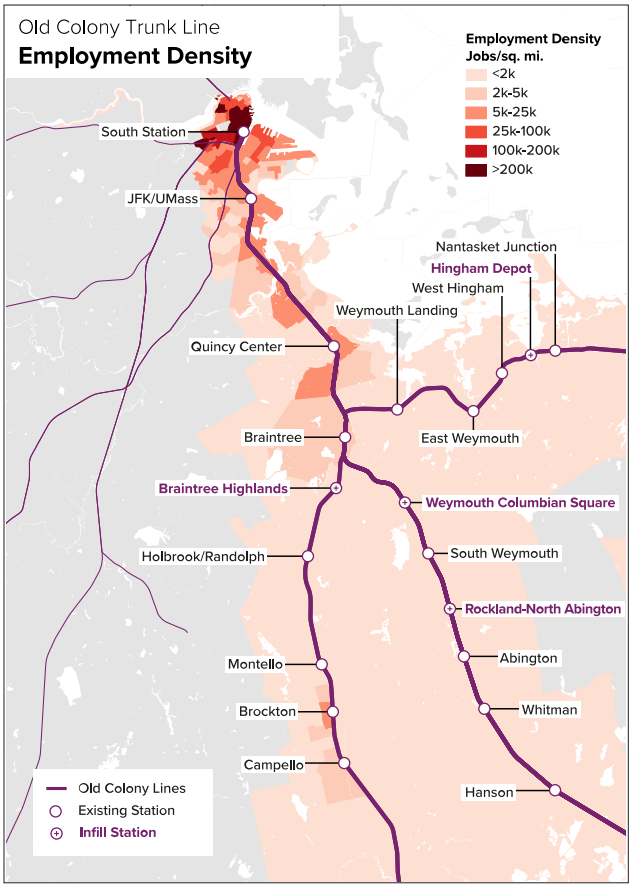
Based on local planning in towns along the line, future job development along the Old Colony lines is promising. The relative affordability has led to towns like Randolph and Weymouth providing affordable housing at the cost of a longer commute as rents have risen in Greater Boston. Within a mile of Quincy Center Station, the city is considering rezoning the former Graziano Concrete site to build several new office condominiums and a large warehouse. In South Weymouth, the ongoing Union Point development has already added hundreds of units, and more are being built[2]. Wareham Village is proposing zoning changes to the area directly adjacent to the proposed Wareham Station to allow taller buildings, promoting new business development.

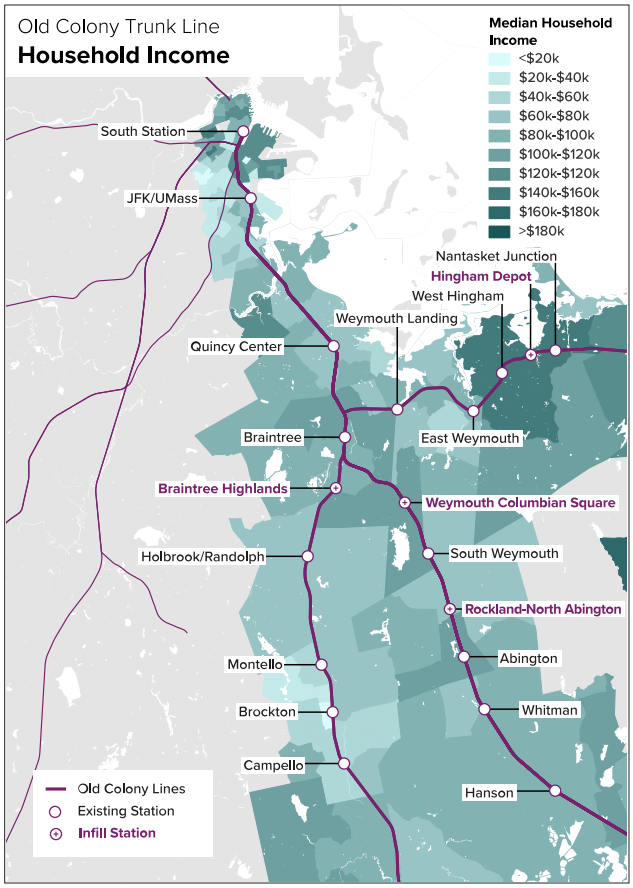
Many Old Colony stations are exurban park-and-rides that could easily accommodate transit-oriented development. Better frequency would also make the Brockton stations attractive for development. In South Weymouth, 3,855 housing units and six million square feet of commercial space are planned for Union Point next to the South Weymouth Station[3]. Over a thousand homes have already been built.

The apartment buildings recently built next to Plymouth station serve as an example of transit-oriented development that could be done at other stations on the network, increasing access and decreasing trafific.

2 *Metropolitan Area Planning Council. MassBuilds. https://www.massbuilds.com/map?hu=gt%3B100*

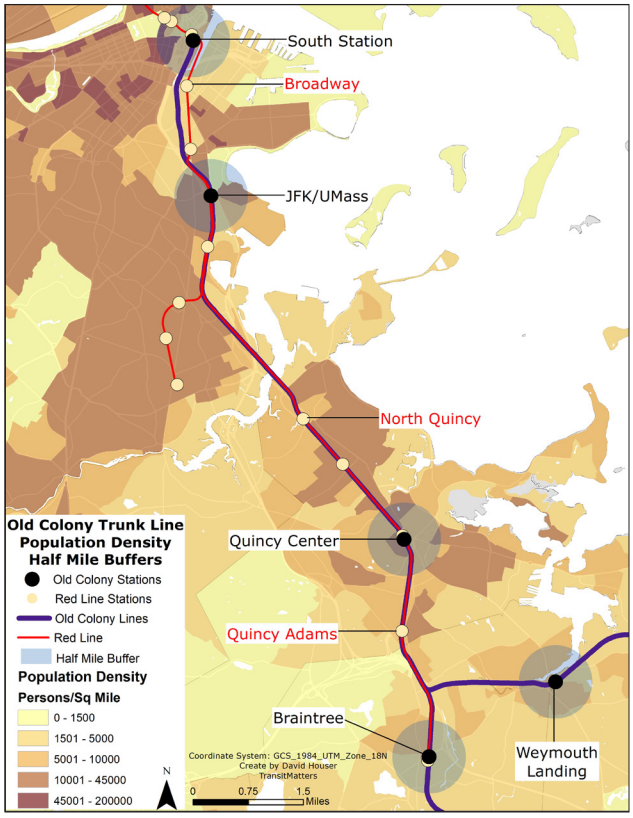
3 *Trufant, Jessica. "Union Point board selects Brookfield Properties as master developer." https://www.patriotledger.com/news/20200115/union-point-board-selects-brookfield-properties-as-new-master-developer*





While downtown Boston boasts the highest density of jobs on the line, stations along the shared trunk and immediately following the split provide access to a number of other dense neighborhoods and job centers. Transferring to the parallel red line branch increases this access further, although the ease of these transfers could be improved.

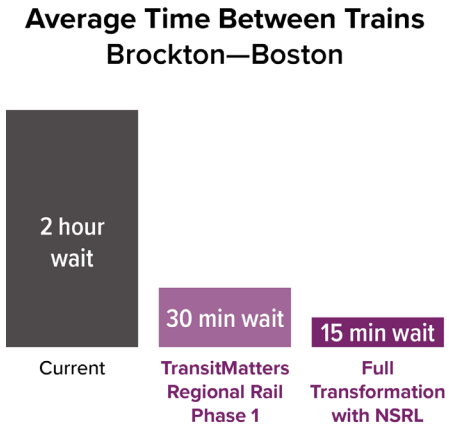
Population density around stations south of Braintree can be seen in the map on page 7.



Improved Brockton Service

The Middleborough/Lakeville Line serves the city of Brockton (pop. 95,426), the most important location on the Old Colony system outside Boston and the trunk. There are 8,000 jobs within half a mile of the station, the fifth-most in the system outside Boston. Two other stations in the city, Campello and Montello, add another 3,500. We expect these numbers to increase with more frequent and more affordable rail service. It's crucial to build a system that helps Brockton grow as a regional center, as per municipal plans to build downtown housing and improve pedestrian links[4], and encourages people to use mass transit not just to get to 9-to-5 white-collar Boston jobs but also to jobs in Brockton.

But Brockton remains a bedroom community, and 9,000 residents work in Boston and Cambridge. Currently, the most frequent means of commuting between Brockton and Boston are the Brockton Area Transit (BAT) #12 bus to Ashmont, with 2,100 daily riders pre-COVID[5], and the MBTA's duplicative Route #240, with another 2,500. This is a lengthy trip, just over an hour to South Station including a transfer to the Red Line.



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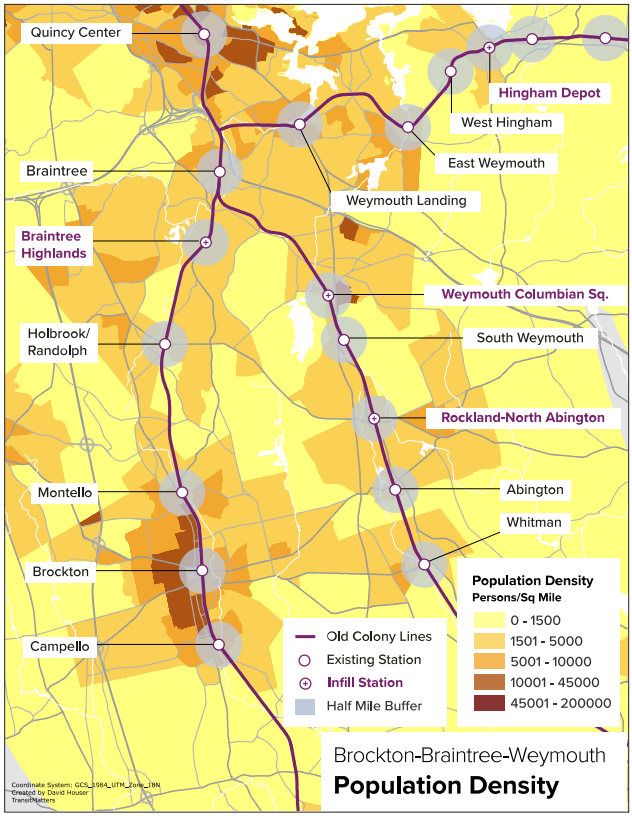
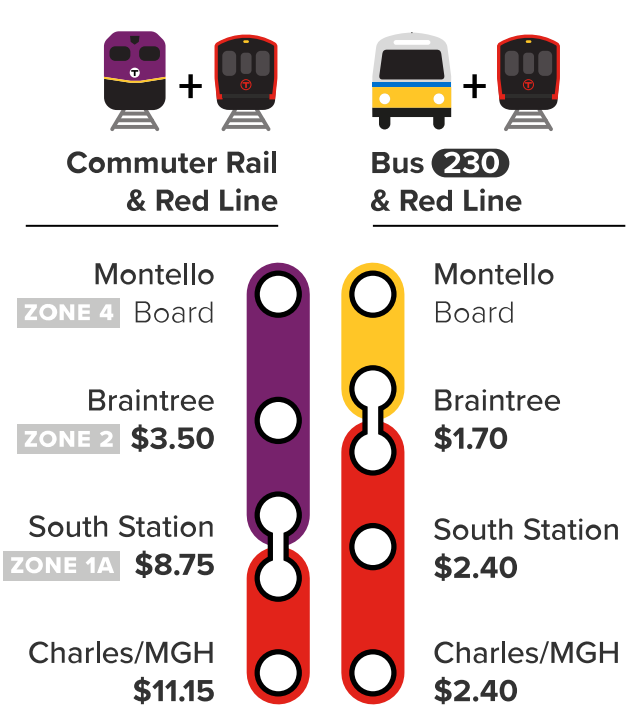


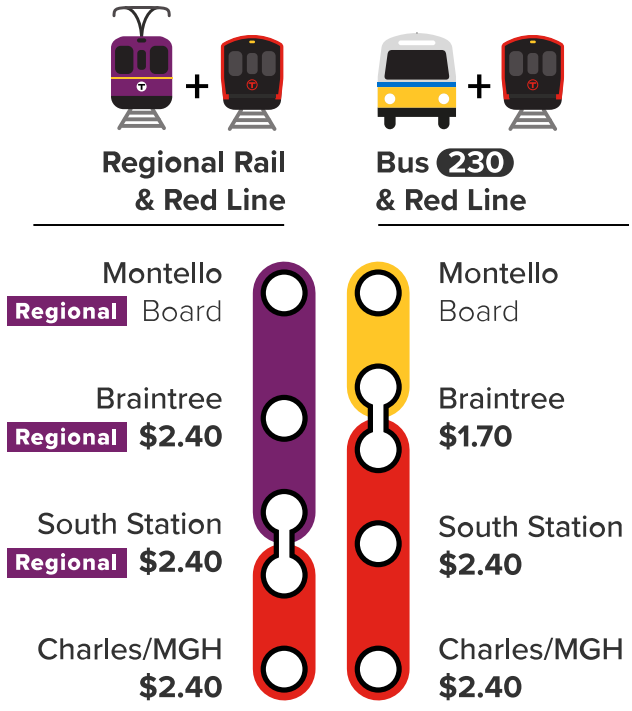
Beyond the trunk, the stations begin serving less dense, more suburban areas, with the exception of the three Brockton stations that serve the dense gateway city.

4 *"Transforming Downtown Brockton". City of Brockton Planning and Economic Development Department.* https://brockton.ma.us/city-departments/planning/transforming-downtown/

5 *"BAT Awarded Three MassDOT Grants for Expanded and Increased Service". Brockton Area Transit.* https://www.ridebat.com/bat-awarded-three-massdot-grants-for-expanded-and-increased-service/



The current fare system charges considerably more to take a trip by rail versus a slower bus and subway transfer.



Under the proposed fare system, traveling the same distance costs the same reasonable price, regardless of mode used.

Commuter rail today is faster but prohibitively expensive: it costs $8.75 one-way to South Station or $281 monthly, whereas connecting between the BAT 12 route and the Red Line is $4.65 one-way or $155 monthly. Brockton has a poverty rate of 17.8% (compared to 9.4% statewide and 19% in Boston)[6], and housing and transportation account for 45% of annual household expenses[7]; lower-income people are fare-sensitive and will suffer through an hour-long two-seat ride if it is cheaper.

Currently there is a pilot program between BAT and the MBTA to reduce the fare on commuter rail from Brockton to Boston to a Zone 1A fare[8] ($2.40 one-way or $90 monthly). The pilot is limited to 250 Brockton residents and was initially scheduled to run through May 31 2021, but this program has received sufficient funding to be extended[9].

Our proposal would instead give Brockton a direct train to South Station at least every half hour, directly reaching downtown's highest job concentration, permanently charging a similar fare to the current BAT 12 + Red Line combination.

Fortunately, it is possible to increase commuter rail frequency to Brockton to half-hourly even in the near term, charge the same fare as the BAT + Red Line combination, and write timetables that ensure minimum waiting time between the buses and the trains. Trains would be slower than with electrification, taking 35 minutes between South Station and Brockton rather than 24. Passengers from Kingston and (via an existing wye) Greenbush would need to change trains at Braintree because of the bottleneck.

6 *"Quick Facts: Boston city, Massachusetts." US Census Bureau (2019 numbers).* https://www.census.gov/quickfacts/fact/table/bostoncitymassachusetts/IPE120219#IPE120219

7 *Using the figures for regional moderate income. Center for Neighborhood Technology. Housing + Transportation Index.* https://htaindex.cnt.org/fact-sheets/?lat=42.0834335&lng=-71.0183787&focus=place&gid=11467#fs

8 *"Brockton Commuter Rail Fare Initiative". Massachusetts Bay Transportation Authority.* https://www.mbta.com/projects/brockton-commuter-rail-fare-initiative

9 *MilNeil, Christian. "PVTA to debut Northampton-Springfield express route with electric buses". Streetsblog Mass.* https://mass.streetsblog.org/2021/03/30/pvta-to-debut-northampton-springfield-express-route-with-electric-buses/

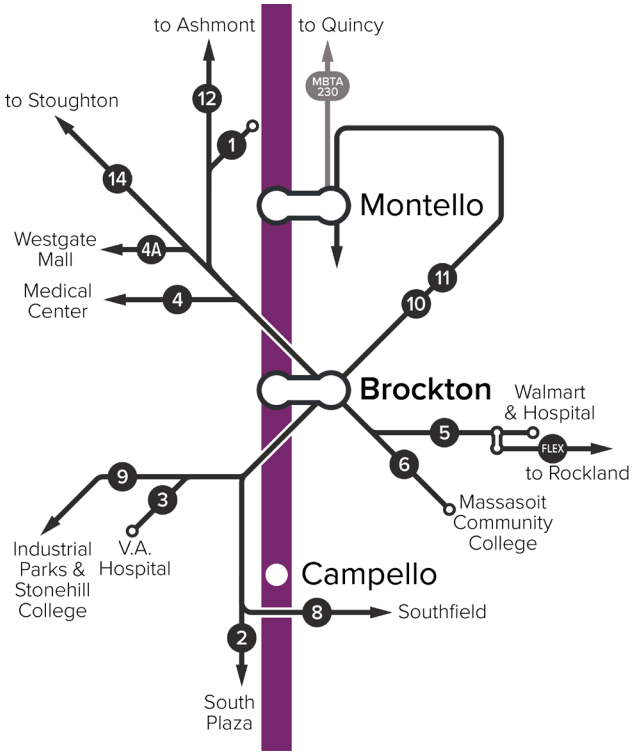
Bus Connections

Service should be scheduled to facilitate timed connections between the bus and rail network to serve both workers and residents in the area. Consolidation with overlapping buses is possible as an early action item on the Middleborough/Lakeville Line, creating better commutes into Boston and reverse commutes, while reducing overall system costs with fewer buses.

At moderate to low frequency (15-30 minutes), rail and bus transfers should be timed. Happily, not only do almost all of BAT's routes serve the same complex as the rail station, but also they are already timed to connect with one another. This method, known as pulse scheduling, is ideal for small city bus systems. Doing so makes such integrated scheduling easy, as train arrivals and departures can be timed within the pulse window, and vice versa. Moreover, our schedules for both pre- and post-electrification assume trains meet at Brockton, so the bus pulse would connect to trains in both directions.

In fact, the bus-rail pulse at Brockton is the cornerstone of our timetable: everything else, including additional capacity improvements elsewhere up and down the line, flows from the need to provide timed connections between buses and trains in both directions. This comes from Brockton's unique situation among the Gateway Cities: it is one of the largest job concentrations in the region, even greater than Lowell and Haverhill, but it also is in the middle of the line rather than at its end like Providence or Worcester. This makes it possible to schedule the line so that trains arrive on the hour every half hour in both directions.

With half-hourly headways providing a more frequent, faster trip to South Station (the highest job concentration in Downtown Boston) as well as JFK/UMass, Quincy and Braintree, there is also an opportunity to enhance system-wide frequency on BAT by redistributing service hours. Brockton could have more east-west bus service, which would improve access to jobs and activities in the city and region as a whole.



Brockton's downtown rail station is the terminus for many of the city's bus routes. Aligning rail and bus schedules would allow for easy transfers and less waiting.

BAT routes also serve Bridgewater, which are already effectively campus shuttles for Bridgewater State and could be timed with the trains to some extent. In all cases, transfers between Regional Rail and BAT service must be free, with revenue-sharing agreements developed to handle financial matters.

Required Infrastructure Investment

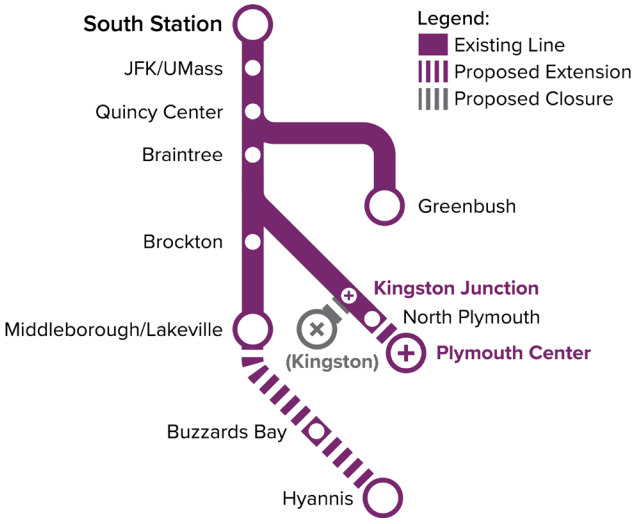
There is great potential for ridership on the Old Colony Lines, thanks to the already-existing development in Brockton and Plymouth and student travel to Bridgewater State. However, the Commonwealth must be ready to invest significant sums of money into infrastructure upgrades. Without those, ridership will remain weak.

Accessibility

Fortunately, the stations on the Old Colony Lines are all high-platform. The system only reopened in the 1990s-2000s, having been closed for over a generation, and therefore stations were built with the modern Americans with Disabilities Act in mind. There is full wheelchair accessibility already and no need for doors interfacing with low platforms.

Further improvements in accessibility will come from the purchase of new trains with automatic platform extenders, which bridge the narrow gap between the platform and the train and eliminate any chance a person in a wheelchair or with a stroller or carrying luggage will get stuck. This technology is routine in Zurich, and after it was successfully introduced to the United States with Brightline service, the FRA is making it into a national mandate.

PROPOSED LINE CHANGES AND EXTENSIONS, AT A GLANCE



Electrification

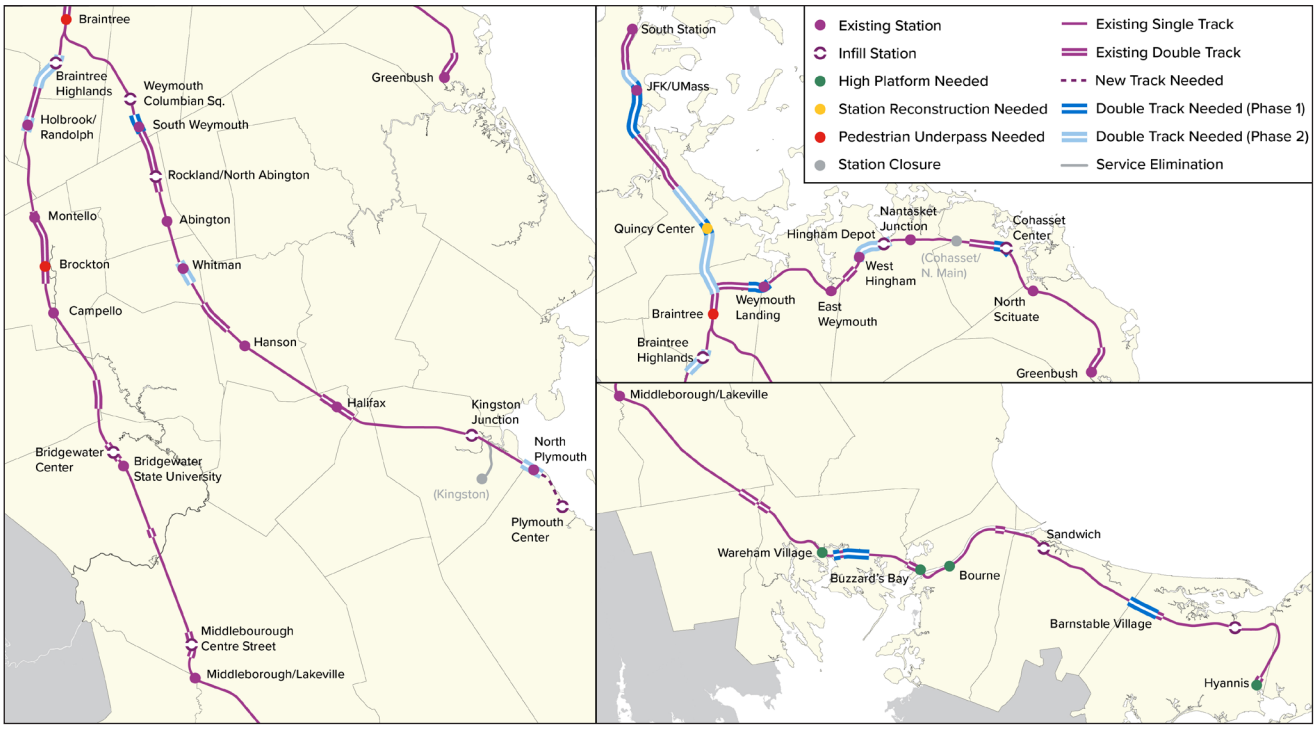
Electrifying the Old Colony trunk line and its three branches, about 81 miles total, would cost between $180 and $350 million, based on electrification costs in France, Germany, Austria, Norway, Denmark, Israel and New Zealand. The notional costs per segment are $25-50 million from South Station to Braintree, and $50-100 million for each branch.

The costs are likely to fall close to the lower end of this range, as the line has extensive single track sections and no need for bridge or tunnel modifications.

Capital Costs, Pre-NSRL

Project Type	South Station to Braintree	Middleborough/ Lakeville	Middleborough to Hyannis	Greenbush	Plymouth	Total
Electrification	$30M	$60M	$80M	$60M	$60M	**$290M**
Double Track	$40M	—	$10M	$15M	$15M	**$80M**
Platforms and Stations	$50M	$60M	$20M	$40M	$90M	**$260M**
Total	**$120M**	**$120M**	**$110M**	**$115M**	**$165M**	**$630M**

INFRASTRUCTURE INVESTMENT IN-DEPTH: LOCATIONS OF ALL RECOMMENDED UPGRADES ALONG THE LINES



High-level platforms allow passengers to easily step off the train without climbing stairs. These are needed at the stations along the Hyannis extension.

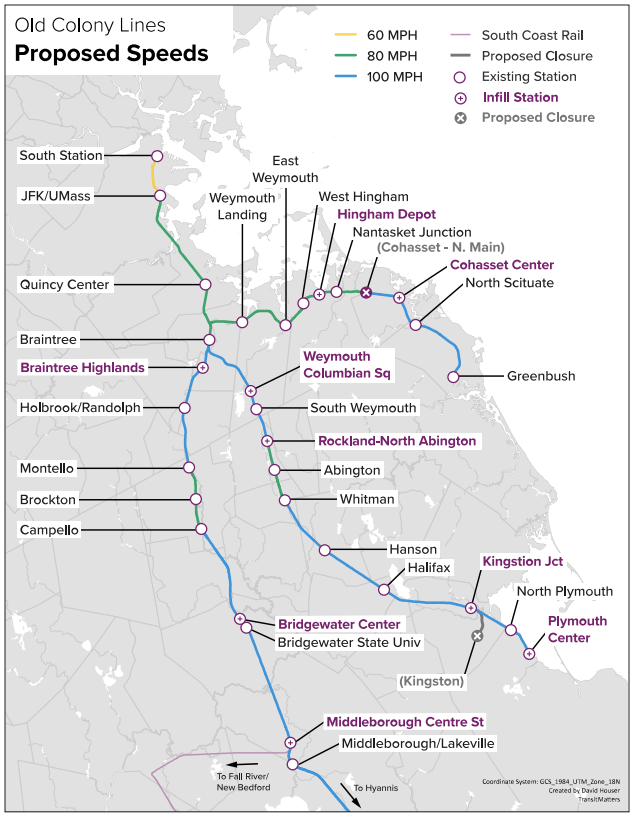
While the full lines don't require double-tracking to achieve high performance, building additional tracks in a few specific locations is key in allowing trains to pass each other.

Credit: Pi.1415926535, licensed under CC BY-SA 3.0, via Wikimedia Commons

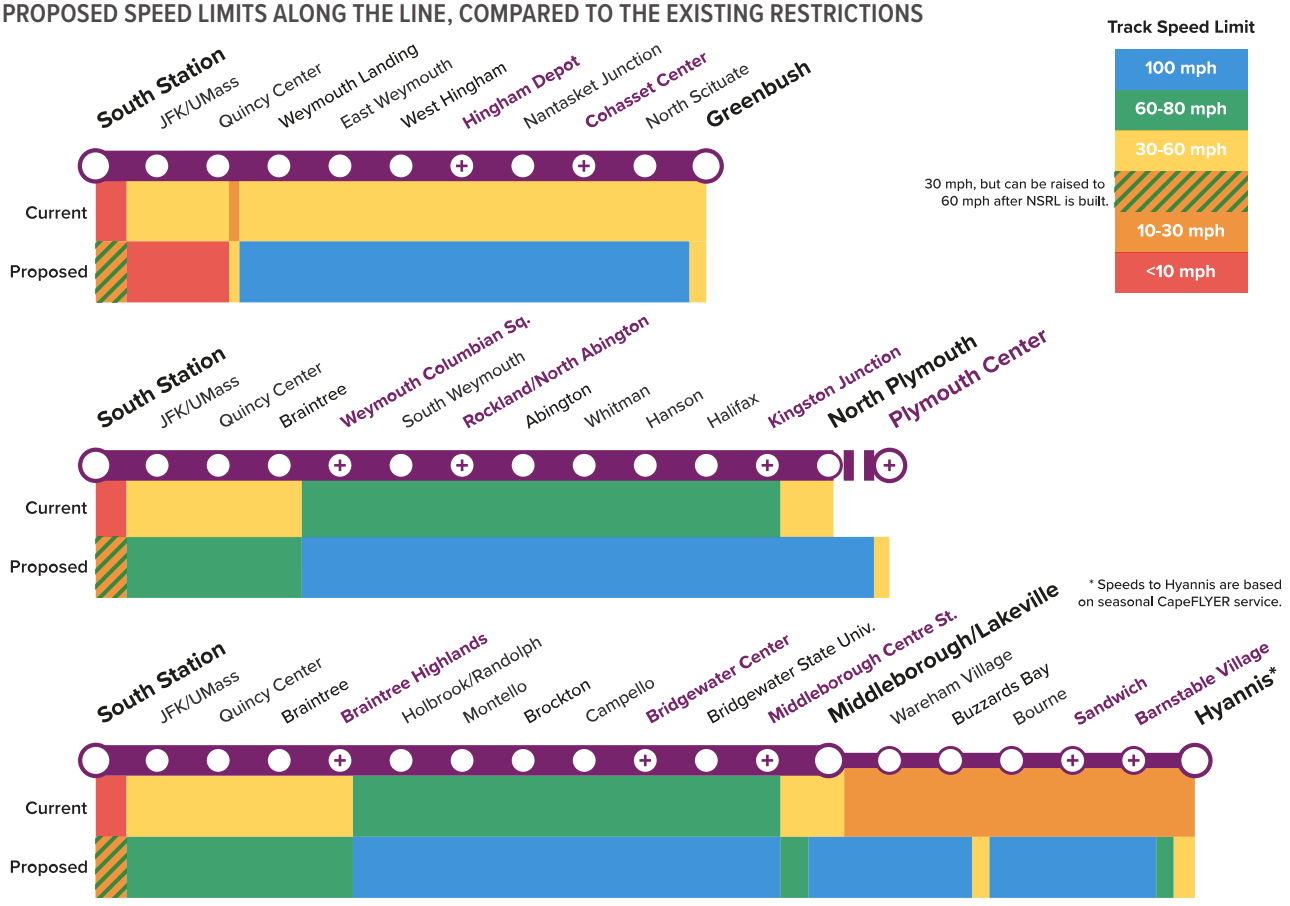
Speed

The top speed should be 100 miles per hour. Long stretches of the Middleborough Line are straight and have wide stop spacing; we propose infill at a few locations, such as Bridgewater and Middleborough, but those are pairs of stations in short succession, with wide separation to the next station on which segments high speeds are achievable. It's also especially useful for the extension we propose to Cape Cod: with long stretches of 100 mph, our proposed timetable averages 60 mph.

On the Plymouth Line, there are shorter segments where 100 mph is achievable. The stop spacing is denser, and the distance from South Station to Plymouth is half as high as to Cape Cod. On the curvier Greenbush Line, only short stretches are good enough for 100, and a blanket 80 restriction may be acceptable - it would only raise end-to-end trip times by 50 seconds.



PROPOSED SPEED LIMITS ALONG THE LINE, COMPARED TO THE EXISTING RESTRICTIONS



Capacity Constraints

Much of the system is single-track. This means that trains have to be scheduled delicately: inbound and outbound trains can't cross except at dedicated locations with double tracking, which are called meets. Meets have to be placed at intervals equal to half the headway: with half-hourly frequency, meets occur every 15 minutes.

The ideal location for a meet is a station. The reason is that the timetables are in practice accurate only to within about a minute, so unless there is a long section that is double-track, it is best to meet at a station, where the train already spends time embarking and disembarking passengers.

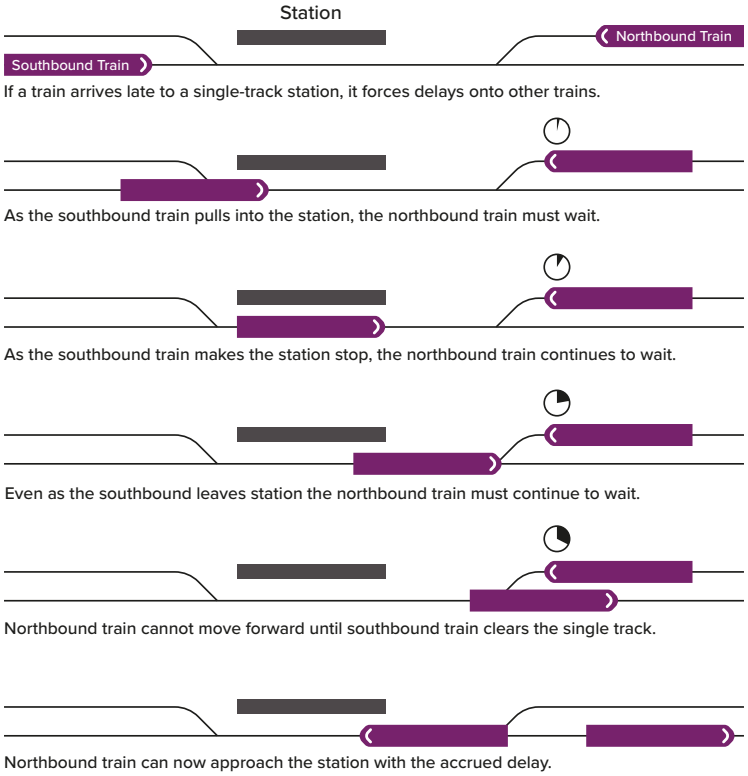
Double Track: Branches

For half-hourly service, it is fortunate that the Middleborough Line needs no further construction: 15 minutes south of Brockton is the center of Middleborough, where the line is already triple-track. However, the Plymouth and Greenbush Lines do need some extra investment.

The Plymouth Line has meets at South Weymouth and just north of Halifax under our proposed schedule. Halifax is double-track already, but South Weymouth is single-track and requires a second track as well as a new station platform on the new track, at a cost of perhaps $10-15 million.

The Greenbush Line requires two meets as well. One is just west of Weymouth Landing; a mile-long double-track segment already exists here, which can be extended farther east. The right of way, including a grade separation, is already sufficiently wide. The other meet is at the center of Cohasset, where we propose the construction of an infill station. This section is single-track, but there is generous space for a second track and a station should be built anyway to facilitate walk-up access from the town center. Based on recent MBTA costs, an infill station is about $20 million, and double tracking is in the $5-10 million [per-mile] range, though in some cases costs can be lower.[10]

HOW MEETS WORK AT A SINGLE-TRACK STATION, WITHOUT PROPER SCHEDULING


Station
Northbound Train
Southbound Train
If a train arrives late to a single-track station, it forces delays onto other trains.
As the southbound train pulls into the station, the northbound train must wait.
As the southbound train makes the station stop, the northbound train continues to wait.
Even as the southbound leaves station the northbound train must continue to wait.
Northbound train cannot move forward until southbound train clears the single track.
Northbound train can now approach the station with the accrued delay.

10 *Double tracking costs are based on the recent doubling on the Franklin Line.*

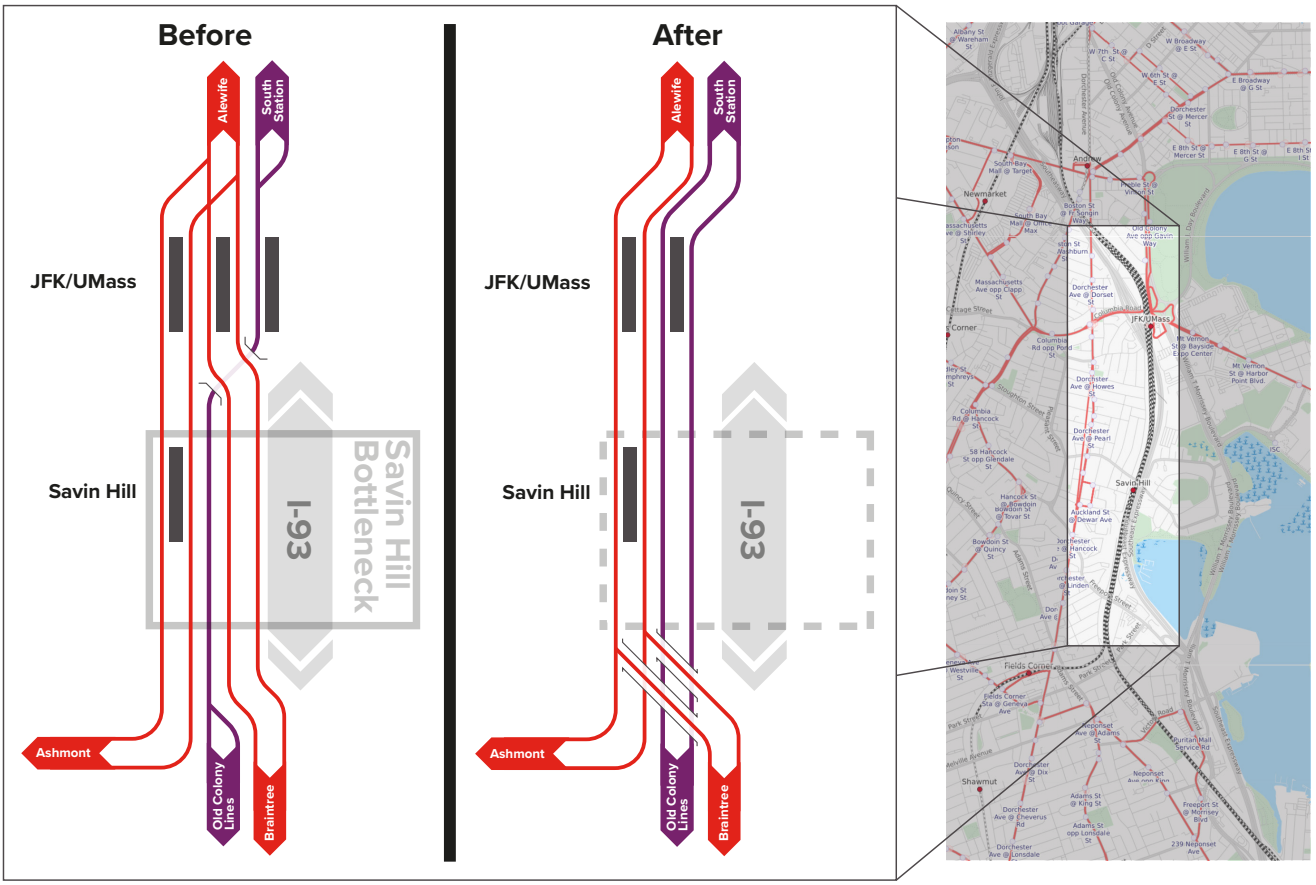
Double Track: Trunk

The Old Colony Main Line is single tracked for five miles between Dorchester and Braintree, which especially constrains the timetable. We propose to interline the three branches so that trains run every 10 minutes on the trunk. At this frequency meets happen every 5 minutes and nearly all lines that run with such frequency are entirely double-track. However, the physical constraints in Quincy are such that, until the North-South Rail Link (NSRL) is built, the trunk should only be partially doubled.

Unfortunately, the three interstation segments on the trunk - South Station-JFK/UMass, JFK/UMass-Quincy, Quincy-Braintree, are not exactly 5 minutes each. But they are close: JFK/UMass-Quincy is 6 minutes, the others are 4 minutes each. Thus, there are two options: option 1 is to meet at JFK/UMass and Braintree and just north of Quincy, and option 2 is to meet at Quincy and just south of JFK/UMass and Braintree.

In either option, JFK/UMass meets involve taking two tracks from the Red Line Braintree branch by changing the location at which Braintree and Ashmont trains diverge. Instead of diverging at JFK/UMass station, both branches would instead run through both JFK/UMass and Savin Hill on the same tracks. The branches would then diverge at a flying junction just north of Park St in Dorchester. This would increase frequency of service to Savin Hill, and would free up two tracks for Regional Rail, resolving the bottleneck between JFK/UMass and the Neponset River Bridge. The cost for this is $30-50 million, similar to a suburban grade separation, as the area is unconstrained.

PROPOSED RECONFIGURATION OF TRACKS AROUND JFK/UMASS AND SAVIN HILL STATIONS



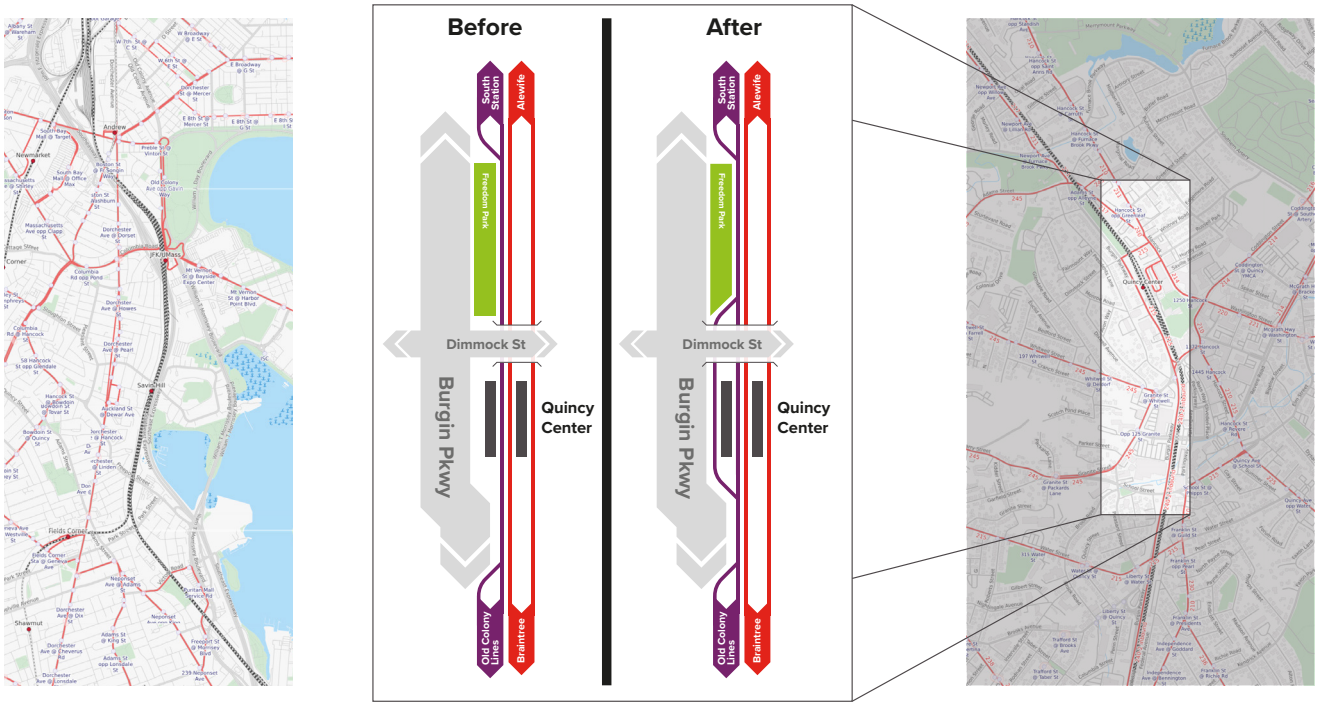
In Quincy, option 1 requires meeting at a point located a minute north of Quincy Center. This is underneath Adams Street, where there is only room for three tracks (two Red Line, one Regional Rail) and not four. The advantage is that this would not require widening the Dimmock Street bridge just north of Quincy Center, but it would require doubling the entire segment between Adams and Dimmock Streets, including retaining wall work, and even then the schedule would be vulnerable to disruption.

Option 2 requires rebuilding the Quincy Center station, which may require expanding the right of way, but there may be sufficient room for another track and island platform in the current footprint. Quincy Center station is nearly 50 years old and has already gone through significant structural changes with the recent garage demolition. Planning, design and construction of a second track and new island platform must occur before air rights development is undertaken.

Braintree is already double-track for option 1. For option 2, the area just south of it is single-track on the Middleborough/Lakeville and Plymouth lines; doubling them is possible, but it's equally possible to schedule trains so that there is no meet at Braintree but rather at East Braintree on the Greenbush Line, where there is already double track.

Both Quincy/Braintree options are viable and should be studied further, but we believe option 2 is likely to be better, as it requires less complex infrastructure construction.

PROPOSED RECONFIGURATION OF TRACKS AROUND QUINCY CENTER STATION



Further Investments

North South Rail Link

NSRL requires additional double tracking on the Old Colony lines, most extensively on the main line, for two reasons.

First, NSRL imposes dependency between the Old Colony schedules and those of the Fairmount Line as they would share a tunnel, not to mention dependency with the North Side lines they would match with. Sharing with a lengthy single track trunk would harm reliability on all involved lines, and introduce uneven headways.

Second, NSRL improves service and connectivity to the point that it would be reasonable to double peak frequency on each branch: a train every 15 minutes instead of every 30. When accommodating 5-minute headways, it is no longer possible to have any single track on the trunk.

15-minute peak headways on the branches require additional double tracking there as well, as there will be more meets. (The minimum case assumes that each paired line on the North Side is fully double-track.[11]) On the Middleborough/Lakeville Line, there are additional meets at Braintree Highlands, which requires doubling, and Bridgewater Center, where there is double track. Fortunately, both are ideal infill stations. On the Greenbush Line, this would be at West Hingham, Hingham Depot, or in between the two, requiring doubling in either case. On the Plymouth Line, the new meet sites to be doubled are Whitman and the existing Plymouth station (not Plymouth Center).

The rebuilt Wamsutta Bridge in New Bedford was one of many infrastructure projects planned and completed as part of the South Coast Rail expansion.

South Coast Rail

During phase one of South Coast Rail (SCR), trains to Fall River and New Bedford will simply be extensions of current Middleborough/Lakeville line service. Trains will run along the existing Middleborough Line trackage until reaching a junction in downtown Middleborough. At the newly constructed Pilgrim Junction station in downtown Middleborough, the SCR route will diverge onto new tracks, stop at East Taunton, and then to the New Bedford and Fall River branches. This route will be a temporary measure until the completion of phase two when trains will run via an electrified extension of the Stoughton branch to East Taunton and on to Fall River/ New Bedford.

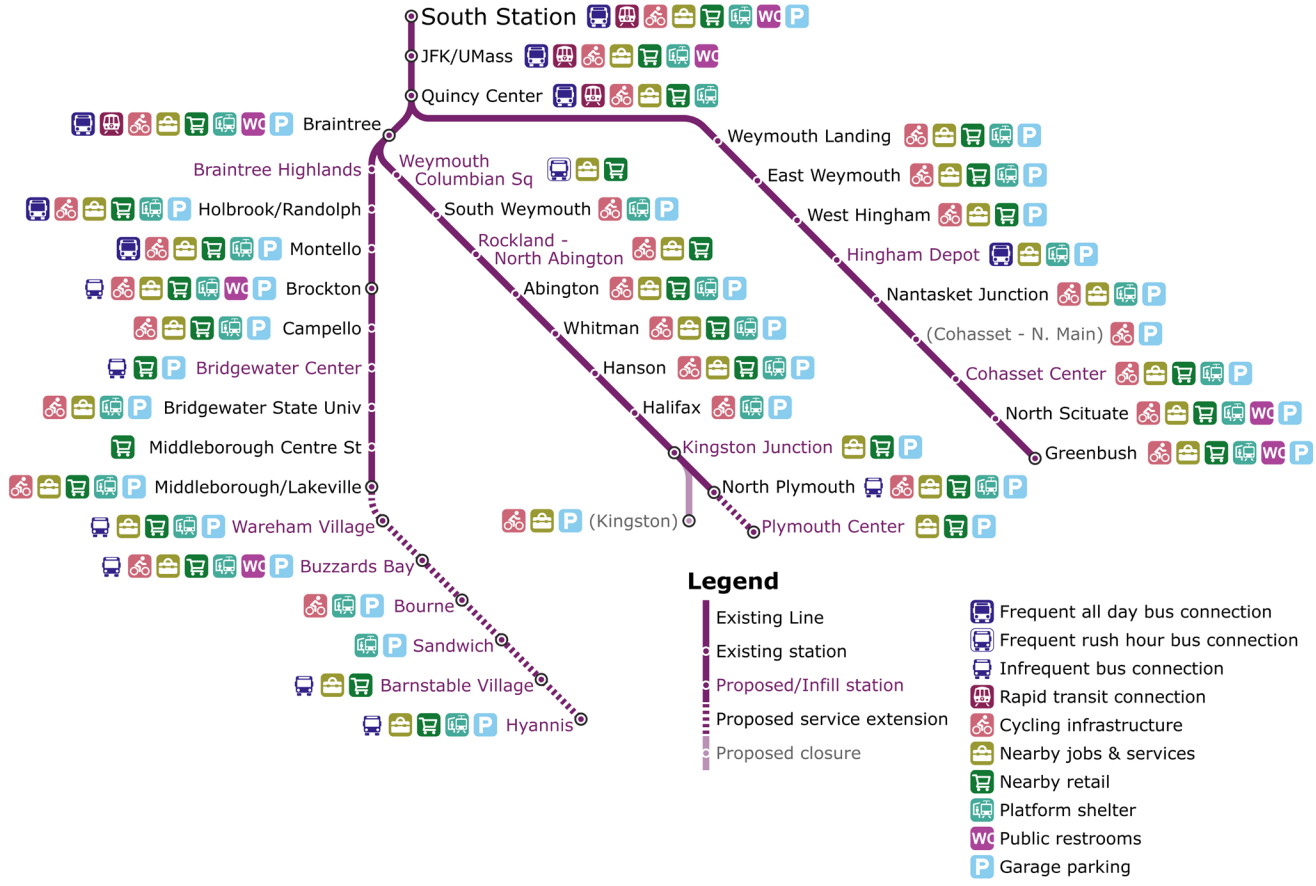
11 *This is the case on the Fitchburg Line with the exception of Waltham Center, which requires doubling in any event to accommodate NSRL headways, and the entirety of the Lowell Line, though future extension to New Hampshire will traverse largely single-track.*

Station Access

The Old Colony Lines require extensive modifications to improve access to the stations. Some stations need to be moved from their current locations in order to improve connectivity. In other cases, infill stations are justified. By and large, the Old Colony stations were designed for park and ride travel, not walkable access to nearby destinations or transit mode transfer. This is particularly salient in Brockton, which has a dense downtown. At stations closer to Boston, such as Braintree, improving mode transfer to buses and the subway is the largest need.

At Braintree, access between the commuter rail platform and the Red Line is difficult, because the two platforms are disconnected; a pedestrian underpass would help improve circulation, but riders can make easier transfers at Quincy Center and JFK/UMass. Although Brockton's station location is great, today pedestrians must cross active railroad tracks in order to access the station which can be unsafe and slow. Therefore, we recommend the construction of a pedestrian underpass here as well.

TRANSIT CONNECTIONS, PARKING, DEVELOPMENT, AND AMENITIES AT STATIONS



Infill Stations

Middleborough/Lakeville Line

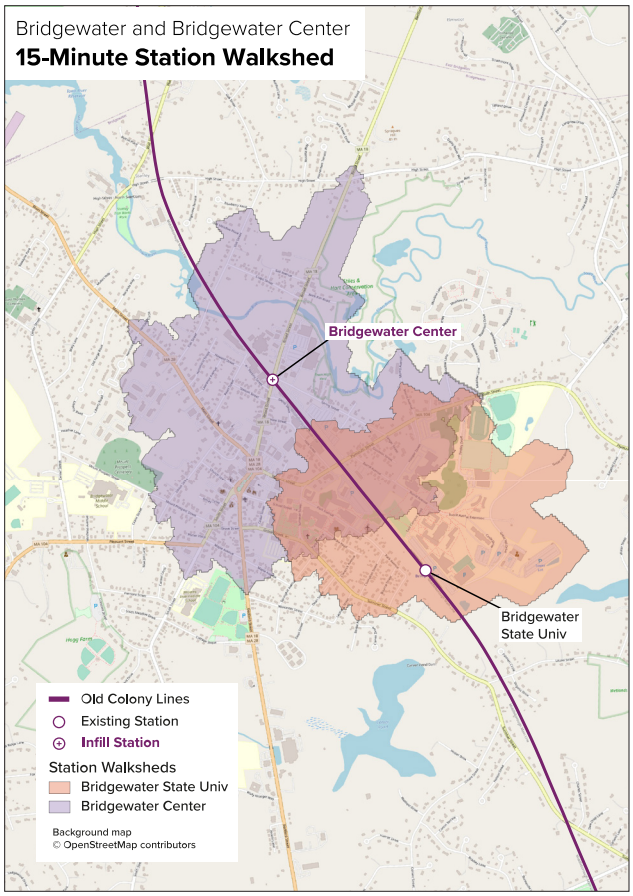
Braintree Highlands —
Washington Street at Peach Street

Braintree Highlands is a small neighborhood between Braintree and Holbrook/Randolph. It is a useful location to turn into an infill station under our preferred scheduling for the trunk, based on the exact locations of meets on both sides, at Quincy and Brockton. Post-NSRL, a meet at Braintree Highlands becomes necessary to enable 15-minute headways, so the station should be built with double track or in a manner that allows future double track.

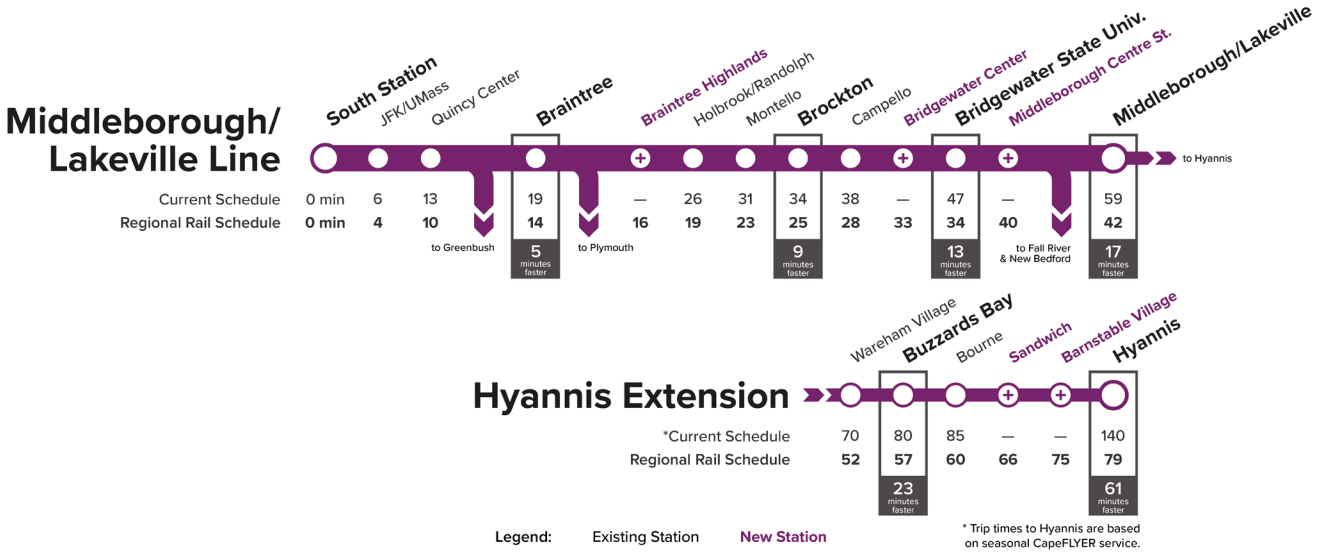
Bridgewater Center —
Plymouth Street, Broad Street, or intermediate

Bridgewater's original station was near the center of town. It was built in 1893 and closed in 1959 when Old Colony passenger service was discontinued. When Middleborough/Lakeville service was restored in the 1990s, the traditional site was abandoned in favor of a park-and-ride station located on the Bridgewater State University campus. The campus station serves a purpose and should be retained, but the historical site has much better access to Bridgewater's walkable town center, in walking distance to over 2,000 jobs, compared with only 550 for the current station.

There are three possible sites: at Broad Street, Plymouth Street, or between the two. The advantage of the last option is that it is already double-track, and a two-track Bridgewater Center station is also a scheduled "meet" for trains running every 15 minutes, like Braintree Highlands. However, if double track length needs to be extended anyway to ensure sufficient distance for the meet, then the station should be aligned closest to Broad Street, as it provides access to more jobs and creates less overlap with the existing station at Bridgewater State than locating the station at Plymouth Street would.



The proposed Bridgewater Center station would put much of Bridgewater's downtown within a walkable distance, versus the current station (renamed Bridgewater State University) which primarily serves the school.

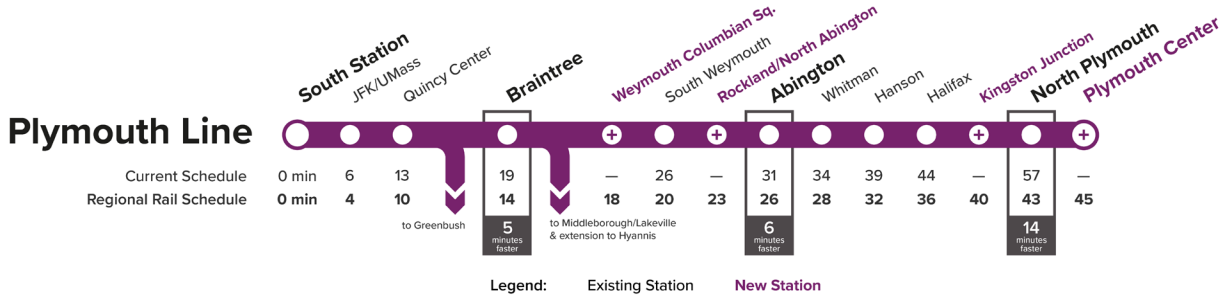


Middleborough Centre Street

The Middleborough/Lakeville station is a park-and-ride outside the town's built-up area, though it has seen some recent development. We propose not to close it, but augment it with a downtown station at Centre Street.

This station is also useful for the temporary route of South Coast Rail now under construction. The current SCR plan is to close Middleborough/Lakeville station and build a new station at Pilgrim Junction, off of the mainline and on the track towards East Taunton. However, this location is away from the downtown area as well.

A Centre Street location was studied but rejected in the 2018 Supplemental Environmental Impact Report because it only has space for 250 parking spaces rather than the 500 at Pilgrim Junction and had a cost estimate of $37 million for a three track station with vertical circulation, compared to $14 million for a single track station at Pilgrim Junction. But Centre Street is a far better location: it is walkable to 1,000 jobs and will stay even after SCR Phase Two moves the line away from the Middleborough Line to the Stoughton Branch.



Plymouth Line

Weymouth Columbian Square — Derby Street or Randolph Street

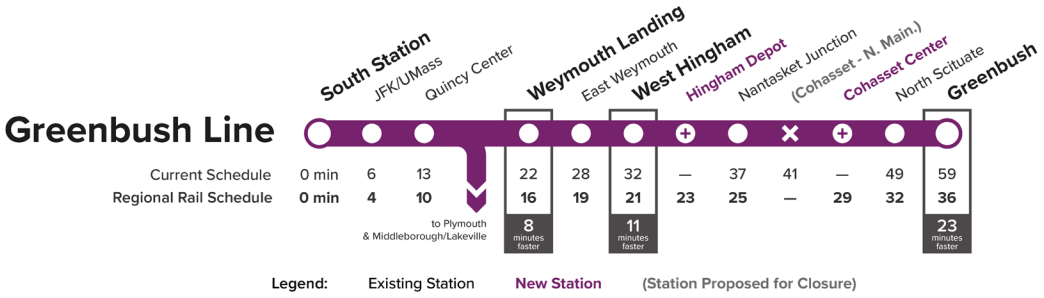
Much like Braintree Highlands on the Middleborough Line, a stop near Columbian Square is useful if there is a minute of slack in the timetable. Moreover, South Shore Hospital, with an additional 3,726 jobs, is just outside the half-mile radius of either station location.

Rockland-North Abington — Railroad Street at Harrison Avenue, Abington

This is a historical depot, in a small town center location with only 500 jobs, but is a walkable location and could have a bus running east-west on North Avenue to Rockland.

Kingston Junction — Summer Street at Evergreen Street

Kingston is currently served by a park-and-ride off Route 3 on a spur from the main line, creating operational issues: when a line has two termini, the service frequency for each terminal station is cut in half. As we discuss below, the current Kingston station should be eliminated and replaced with a new station in the center of town near the historic Kingston Depot. This would require little work for a single-platform station in town center. The neighborhood has a modest, but not insignificant, 315 jobs.


Greenbush Line
South Station
JFK/UMass
Quincy Center
Weymouth Landing
East Weymouth
West Hingham
Hingham Depot
Nantasket Junction
(Cohasset - N. Main.)
Cohasset Center
North Scituate
Greenbush
Current Schedule 0 min 6 13 22 28 32 — 37 41 — 49 59
Regional Rail Schedule 0 min 4 10 16 19 21 23 25 — 29 32 36
to Plymouth & Middleborough/Lakeville
8 minutes faster
11 minutes faster
23 minutes faster
Legend: Existing Station New Station (Station Proposed for Closure)

Greenbush Line

Hingham Depot — Station Street

Hingham would be better served by a station at the location of its historical depot. The location is already served by two bus lines, the 220 and 714, which connect to Quincy Center and Pemberton Point in Hull: the 714 also connects to the MBTA's ferry service. This location enables Hingham residents and visitors to get to Boston without cars. The downtown also has 795 jobs, the second-most on the Greenbush Line. The station is also a potential meet site for 15-minute peak headways; either it should be built with double track or West Hingham will need to be reconstructed.

Cohasset Center — Pleasant Street

We propose closing the existing Cohasset station and replacing it with a new Cohasset Center station at Pleasant Street, for two reasons. First, this new stop would serve Cohasset's historic downtown, with more jobs in walking distance than the existing site. Second, Cohasset Center is a necessary meet site for half-hourly headways, so a station makes scheduling easier, and trains can take advantage of this scheduling need to pick up and drop off more riders than at the existing stop.

Service Restoration

Plymouth Center

South of Halifax, the Kingston/Plymouth Line further divides into two branches, one to a park-and-ride near Route 3 in Kingston, the other to the current Plymouth station, in Cordage Park. This station, which is currently called Plymouth, is referred to as North Plymouth in our timetables. We recommend that the Plymouth Line be changed from a line oriented around a park-and-ride at Kingston to a line connecting Boston with Plymouth Center, the city's historic terminal. This requires two actions.

Plymouth Restoration

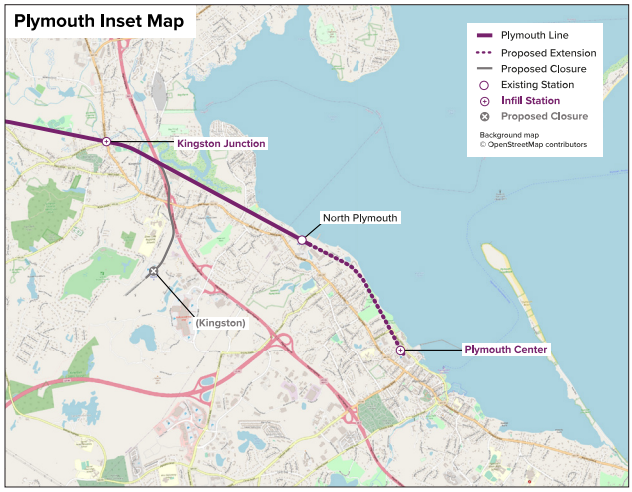
Service to Plymouth Center can be restored within an existing right-of-way. The area around it is a walkable historic center; the Cultural District has massive tourism potential, especially around Water Street. There are 3,700 jobs within half a mile of Downtown Plymouth, more than near all existing stations on the Plymouth Line combined. The North Plymouth station should be preserved; the area has seen recent housing development, a trend which would continue with half-hourly service, and it is also a post-NSRL meet site, making it an ideal station.

Plymouth's historic downtown would become more accessible by extending the line one mile to the south.

Kingston/Plymouth Consolidation

In 2018, Kingston station had 685 daily riders, while Plymouth had fewer than 30 daily riders. There is no service to Plymouth as of this writing, due to the COVID-19 emergency suspensions. But this is a consequence of poor frequency - Plymouth had no rush hour service. Kingston is an isolated park-and-ride with virtually nothing in its walk shed; it cannot attract off-peak or reverse-peak service. This means that under a Regional Rail operating model, ridership potential will be lower.

The Kingston branch's existing infrastructure and space can still be used by the MBTA for overnight storage for rush hour trains, and the parking lot space could be used by the Greater Attleboro-Taunton Regional Transit Authority (GATRA) as a bus storage facility for its Plymouth Area Link fleet. For car access, our proposed Kingston infill station would be in close proximity to Route 3. There is also ample potential parking available near Cordage Park by the existing Plymouth Station, which could absorb some of the parking needs of current Kingston riders.



Kingston Junction would be located at a convenient location for a park-and-ride station, while Plymouth Center would be located in the heart of the downtown waterfront.

Cape Cod

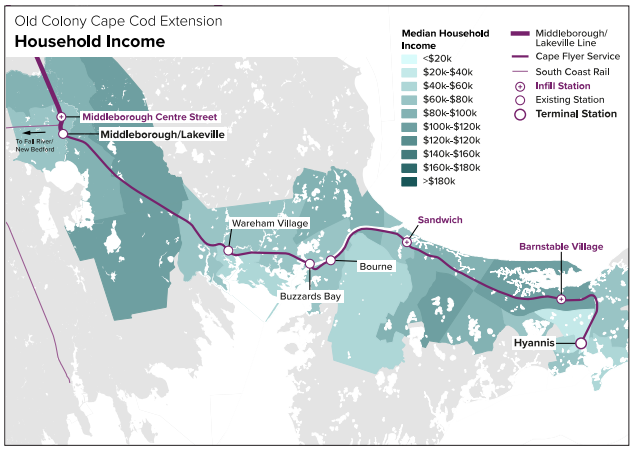
Since 2013, the Middleborough/Lakeville line has hosted the CapeFlyer, which provides weekend service between South Station and Hyannis from Memorial Day to Labor Day. The 78 mile trip is made in approximately 2 and a half hours. In 2018, just under 900 riders took the CapeFlyer each weekend.

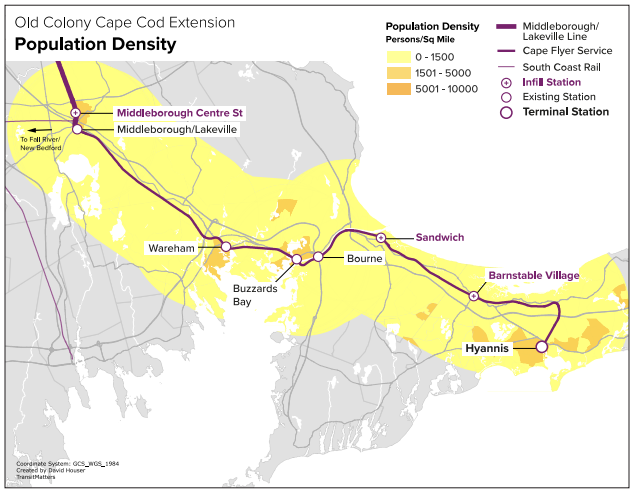
Traffic to the region is bottlenecked by the old and unreliable Bourne and Sagamore bridges at the Cape Cod Canal. As work may begin on replacement bridges in 2025, a multi-modal approach can help alleviate the construction pressure on the 215,000 Cape Cod residents given the 300 days of full bridge closures and 800 planned days of lane closures.[12]

With electrification increasing train speeds, an initial extension to Buzzards Bay, and ultimately Hyannis, should be implemented.

There is interest in year-round service to the area. Hyannis alone has 7,054 jobs within half a mile of the station, not counting the many seasonal workers; the other Cape Flyer stations add 3,017 jobs in total. In 2018, the Cape Cod tourism industry generated 11,000 jobs, $360 million in wages, and $1.3 billion in overall spending, and the tourism season has been expanding beyond the summer[13]. Municipal bodies in Wareham, Buzzards Bay, and Bourne have expressed support[14] for the idea of year-round service, but it has not moved beyond the conceptual phase; Bourne has been insisting on more frequent service as it is part of the MBTA district. During the peak tourist season, faster and frequent all-day service would make rail a more attractive option for reaching the Cape.

DETAIL ON THE REGION SERVED BY YEAR-ROUND SERVICE ON THE PROPOSED CAPE COD EXTENSION



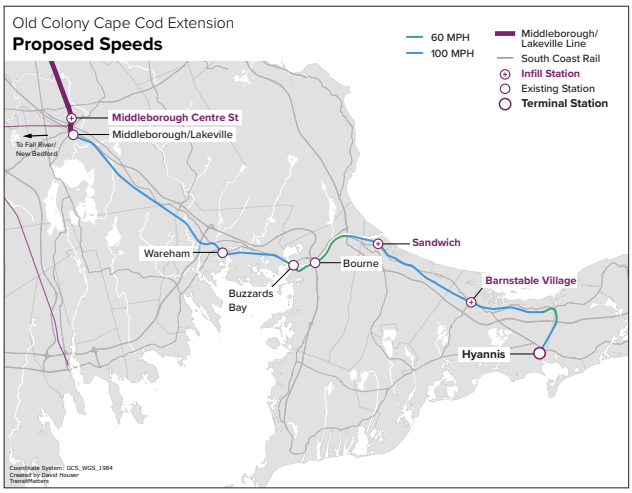


12 *Genter, Ethan. "Cape Cod Canal bridge project casts pall of neighbor". The Quincy Patriot Ledger. https://www.patriotledger.com/story/news/local/2020/08/17/cape-cod-canal-bridge-projects-cast-pall-on-neighbors/42583603/*

13 *Statistics. Cape Cod Chamber of Commerce. https://www.capecodchamber.org/members/membership/statistics/*

14 *Genter, Ethan. "New study renews hope for Cape commuter rail service". The Cape Cod Times. https://www.capecodtimes.com/story/news/2020/12/01/state-explore-options-passenger-trains-between-middleboro-lakeville-and-cape/3780913001/*

With electrification increasing train speeds, an initial extension to Buzzards Bay, and ultimately Hyannis, should be implemented. The track is already in place, and the stations for Wareham and Buzzards Bay would only require conversion of the current mini-high platforms to full-length high platforms to meet Regional Rail requirements. Moreover, the movable bridge over the Cape Cod Canal has priority for rail over boat traffic, since the railroad predates the canal. Electrification should cost $50-100 million, where we expect the cost to be at the lower end as the line is single-track, and the two stations should cost around $10 million each as they are single-track; the double-track meet should be around $10 million as well.



While some bottlenecks would remain due to the route of the tracks, investment in the tracks south of Middleborough/ Lakeville would allow substantially higher speeds than can run on the route today.

The Bourne Bridge, seen here in the foreground, is one of two vehicle bridges in the city expected to undergo construction and replacement in the near future. The Cape Cod Canal Railroad Bridge, in the background, can support improved rail sevice that would reduce traffic and increase access to towns south of the canal.

Bus Connections

Wherever possible, buses and trains should be timed to connect. Bus routes along the corridor are often cheaper than commuter rail, but as with connections at Brockton, fare integration and improved off-peak frequency can improve connectivity from bus to rail.

Trunk Line

In addition to the Red Line, JFK/UMass, Quincy Center, and Braintree feature MBTA bus connections; the Quincy Center hub sees 402 weekday buses, carrying 16,599 passengers. These are split between shorter routes that serve local destinations and longer routes that connect with other commuter rail and Red Line stops. Regional Rail would provide connecting passengers bound for South Station or the other three stations with faster trips relative to the Red Line.

RTA Connections

If demand warrants, there are other good locations for timed transfers between trains and buses on the network, in addition to Brockton. The most compelling is Middleborough Centre Street, as it is located exactly 15 minutes south of Brockton, and thus a meet site. If Brockton is set up as a pulse point with timed bus connections coming every half hour, then Middleborough can be set up this way as well, improving the GATRA-Regional Rail connection.

Plymouth Center could also be a good location for a timed transfer. There are 3,700 jobs within half a mile, as well as some concentration of tourism destinations, so it would be a good place for buses to serve anyway. Once the buses are there, they should connect with the trains; with the timetable we propose, transfers would take about 5-6 minutes from the buses to the northbound trains or from the southbound trains to the buses.

Brockton's bus terminal, located adjacent to the rail station, allows for transfer to many of the city's bus routes. In addition to offering similar facilities, cities along the Old Colony lines should time buses to synchronize with train service..

For the Cape extension, the Cape Cod Regional Transportation Authority offers bus service that intersects with the rail line at two stations. The Sealine extends east from Falmouth, and the H2O route extends west from Orleans both terminating at Hyannis Transportation Center. A third route, the Bourne Run, extends north from Mashpee to Buzzards Bay station. Currently these bus routes operate with hourly frequency. Frequency should be increased to half-hour intervals and scheduled to meet trains at their respective terminating stations.

Train Scheduling

Frequency

With full electrification and double tracking of meet sites, the following frequency is possible:

Stations	Proposed	Current
South Station—Quincy Center	10 MIN	20+ MIN
Quincy Center—Plymouth	30 MIN	120+ MIN
Quincy Center—Middleborough	30 MIN	120+ MIN
Quincy Center—Greenbush	30 MIN	120+ MIN
Middleborough—Hyannis	60 MIN	120+ MIN

With NSRL, double tracking the additional meet sites, and appropriate capacity on the entire Old Colony Main Line, the following frequency is possible:

Stations	Peak	Off-Peak
South Station—Quincy Center	5 MIN	10 MIN
Quincy Center—Plymouth	15 MIN	30 MIN
Quincy Center—Middleborough	15 MIN	30 MIN
Quincy Center—Greenbush	15 MIN	30 MIN
Middleborough—Hyannis	30 MIN	60 MIN

Scheduling

Pre-NSRL, the plan is for an all-day half-hourly clockface schedule on each branch, interlining for a train every 10 minutes between North Braintree Junction and South Station. To optimize the use of existing infrastructure and connections to buses at Brockton, this is the timetable assuming the trunk overtakes are at JFK/UMass and north of Quincy.

For our preferred option of overtakes just south of JFK/UMass and at Quincy, trains depart South Station a minute earlier and arrive a minute later, both :05 every 10 minutes.

Fleet Requirement

This combined timetable requires a total of 14 trainsets; if there is no extension past Middleborough, then only 12 sets are needed. This requires three dedicated platform tracks at South Station, one dedicated for Plymouth trains and two shared between Greenbush and Middleborough trains.

	Outbound		Inbound	
Branch Line	Departure from South Station	Arrival at Branch End	Departure from Branch End	Arrival at South Station
Greenbush	0:15	0:51	1:09	1:45
Hyannis (Middleborough/Lakeville)	0:05	1:24	1:36	2:55
Plymouth	0:25	1:10	1:20	2:05

MIDDLEBOROUGH/LAKEVILLE		
Station	**Proposed**	Current
SOUTH STATION	**0:00**	0:00
JFK/UMASS	0:04	0:06
QUINCY CENTER	0:10	0:13
BRAINTREE	0:14	0:19
Braintree Highlands	0:16	—
HOLBROOK/RANDOLPH	0:29	0:26
MONTELLO	0:23	0:31
BROCKTON	0:25	0:34
CAMPELLO	0:28	0:38
Bridgewater Center	0:33	—
BRIDGEWATER STATE UNIV.	0:34	0:47
Middleborough Centre St.	0:40	—
MIDDLEBOROUGH/LAKEVILLE	**0:42**	0:59
Wareham Village	0:52	—
Buzzards Bay	0:57	—
Bourne	1:00	—
Sandwich	1:06	—
Barnstable Village	1:15	—
Hyannis	**1:19**	—

Legend:
EXISTING STATION
Proposed Infill Station
(Proposed Station for Closure)

PLYMOUTH		
Station	**Proposed**	Current
SOUTH STATION	**0:00**	0:00
JFK/UMASS	0:04	0:06
QUINCY CENTER	0:10	0:13
BRAINTREE	0:14	0:19
Weymouth Columbian Sq.	0:18	—
SOUTH WEYMOUTH	0:20	0:26
Rockland/North Abington	0:23	—
ABINGTON	0:26	0:31
WHITMAN	0:28	0:34
HANSON	0:32	0:39
HALIFAX	0:36	0:44
Kingston Junction	0:40	—
NORTH PLYMOUTH	0:43	0:57
Plymouth Center	**0:45**	—

GREENBUSH		
Station	**Proposed**	Current
SOUTH STATION	**0:00**	0:00
JFK/UMASS	0:04	0:06
QUINCY CENTER	0:10	0:13
WEYMOUTH LANDING	0:16	0:22
EAST WEYMOUTH	0:19	0:28
WEST HINGHAM	0:21	0:32
Hingham Depot	0:23	—
NANTASKET JUNCTION	0:25	0:37
(Cohasset - N. Main.)	—	0:41
Cohasset Center	0:29	—
NORTH SCITUATE	0:32	0:49
GREENBUSH	**0:36**	0:59

What is Regional Rail?

MBTA Commuter Rail operates as a mid-20th century service with a mid-20th century business model. It reflects out of date biases about where people and jobs are located, and about how people desire to get from one place to another. Many people no longer work on a strictly 9 am to 5 pm weekday schedule, and many more want convenient and frequent train schedules that respond to the needs of their daily lives.

> *"The current Commuter Rail paradigm costs way too much money for way too little ridership."*
>
> *— MBTA FMCB Chairman Joe Aiello, 11/20/17*

Our current approach to Commuter Rail, as a business model, fails to offer its rider/customers the service they want and need. As a result it contributes to the region's worsening traffic congestion, keeps Gateway Cities isolated during most of the day, and exacerbates income inequality since the inadequate service compels many to drive – for lower income people, the high cost of owning, maintaining and driving an automobile can have a crippling effect on their ability to make ends meet.

Public transit must be frequent all day, not just at rush hour. A Regional Rail system would have trains running at least every half hour all day in the suburbs and at least every fifteen minutes in Boston and other Inner Core communities.

Regional Rail requires both frequent all day service, accessible platforms and smarter equipment to provide the service. That means high-level platforms at stations to simplify and speed up boarding and alighting. It also means electrification of the system, enabling use of Electric Multiple Units to replace the current push/pull diesel fleet. EMUs will be more reliable and less expensive to maintain, will provide riders with speedier trips, and will provide better service without polluting the air around them.

A highly functioning Regional Rail system includes five critical components:

- **Systemwide electrification** and the purchase of high-performance electric trains.
- **High platforms**, providing universal access and speeding up boarding for everyone.
- **Strategic infrastructure investments** to relieve bottlenecks.
- **Frequent service all day**: every 30 minutes in the suburbs and every 15 minutes in denser neighborhoods.
- **Free transfers** between regional trains, subways, and buses, and fare equalization with the subway in the subway's service area.

And one useful component that will complete cross-region mobility:

- While not critical to implementing a Regional Rail system, **the North-South Rail Link (NSRL)** between North and South Stations, allowing service between any two stations with either a direct trip or a single, seamless transfer, would be a highly useful enhancement providing the flexibility and connectivity to which many riders and potential riders would be drawn.

MORE INFORMATION AND REPORTS AVAILABLE AT:
HTTP://REGIONALRAIL.NET

REGIONAL RAIL FOR METROPOLITAN BOSTON	WINTER '18
REGIONAL RAIL PROOF OF CONCEPT	FALL '19
REGIONAL RAIL PHASE 1	SUMMER '20
PROVIDENCE/STOUGHTON LINE	SPRING '20
FAIRMOUNT LINE	FALL '20
NEWBURYPORT/ROCKPORT LINE	WINTER '21
OLD COLONY LINES	SPRING '21

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